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ABSTRACT

One of the twelve exemplary programs summarized in the Introduction to Right to Read's "Effective Reading Programs: Summaries of 222 Selected Programs" (CS001934), Functional Literacy (FLIT) is a six-week course designed to upgrade the reading abilities of Army inductees to minimal levels necessary for certain career areas. FLIT literacy training is geared to job proficiency rather than to general educational development. The training strands consist of modular instructional units with end-of-module proficiency tests to enable each person to progress at his own pace. Instructional modules in each career cluster are based on job-related Army technical manuals and materials, and modules are available for careers in communications, clerical and mechanical work, and combat; as a medic; and as a cook. (TO/AIR)

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PROGRAM AREA: A job-related literacy training program for young male adults (US Army inductees) to provide a level of functional literacy appropriate to minimal Military Occupational Specialties (MOS) requirements.

PROJECT TITLE: HumRRO Work Unit FLIT (Functional LITeracy).

LOCATION: Fort Ord, California

SOURCES AND LEVEL OF FUNDING: Deputy Chief of Staff for Personnel, Training and Doctrine Command provides funds for Army literacy training at Army Training Centers. Budgets vary depending upon the numbers of personnel requiring training. Per pupil materials cost for the FLIT program is approximately $3.00.

PROGRAM START DATE: April 1972.

BRIEF DESCRIPTION OF PROJECT:

Goals and objectives. To upgrade the reading ability of US Army inductees to the minimum levels of functional literacy required for career fields with large intake. FLIT is the result of a sustained R and D effort studying the disparity between the literacy demands of Army jobs and the literacy skills of personnel assigned to these jobs. In contrast to existing military literacy programs initiated under Project 100,000, FLIT literacy training is geared to actual job proficiency rather than general educational development. The training program for each job consists of modular instructional units with end-of-module proficiency checks enabling men to progress at an individualized pace.

Context. With the aid of a low-cost readability technique developed to estimate the reading grade level needed to read and comprehend Army job manuals, readability estimates were derived from samples of reading materials from seven career fields into which larger numbers of marginally literate men are often assigned. Average reading difficulty for the materials in the seven job areas varied from GED level 10.5 to 12.0.

On the basis of structured interview reports, Job Reading Task Tests (JRTT) were then developed from reading materials used on-the-job by Repairmen, Supply Clerks and Cooks. These were administered to several hundred men to determine how various JRTT percentage correct scores (50%, 60%, 70%) related to general reading ability (measured in grade equivalents). At a 70/70 criterion (70% of the men scoring at or above 70% correct), minimum literacy grade equivalent levels varied from 7.0-8.0 for the Cooks job reading materials to 12.0 for the Supply Clerks job reading materials, considerably in excess of the existent Army-wide established 5.0 goal for GED literacy training. A less demanding 70/50 criterion suggested a minimum targeted level of 6.0.

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The relationships of general reading ability with performance on job sample tests (4-5 hour individually administered "hands-on" job tasks) and job knowledge tests (pencil-and-paper) are shown below, estimated from samples of 400 men each for Cooks, Mechanics, Supply Clerks and Armor Crewmen.

	JRTT correlation with:	
MOS	Job Sample Test	Job Knowledge Test
Armor Crewmen	.32	.57
Cooks	.34	.56
Mechanics	.26	.47
Supply Clerks	.40	.40

Applying a 70/50 criterion for all fields, the minimum literacy level was approximately seventh grade for the job performance test. The minimum literacy level requirement in each job -- defined as that grade level at which men are not over-represented in the bottom quarter on job performance -- was estimated at 7.0-7.9 for Cooks, 8.0 for Armor Crewmen and Mechanics and 9.0 for Supply Clerks.

Thus, on-the-job reading material and reading skills associated with minimum job proficiency requirements for men on the job were both far above the established 5.0 level of general literacy judgementally set by educators as a level of "functional literacy".

Reading test data for February and March 1972 recruits showed that about 1/3 of Category IV men (expected by DoD directives to comprise 20% of the Army's intake) fall below a 7.0 grade reading level, 1/5 below a 6.0 level and 1/10 below a 5.0 level. Assuming a 100,000 a year input, 20,000 are Category IV personnel and of these, 2,000 will qualify for remedial literacy training under the established 5.0 level cutoff. If standards were raised to the more realistic 7.0 level, 6,500 would qualify for literacy training.

FLIT planning began by visiting existing literacy programs at five Army posts, the Air Force literacy school, and the large Job Corps center at San Marcos, Texas. Little of an exemplary nature was found; a variety of programs existed, instructional staff were both civilian and military, selected on no consistent criteria with many having no experience in adult basic education; materials varied, and the conclusion was clear that much Army literacy training success was due to testing artifacts (mainly regression to the mean). It was concluded that the 5.0 level was inadequate for Army Career Fields, past achievement data were suspect in terms of real gain, and that a program of 6-weeks duration should directly deal with on-the-job reading tasks if a subsequent effect on job performance was to be expected.

Program Description.

Grade levels, years of operation, size -- Inductees are selected to FLIT by scoring at GED 6.1 or lower on the USAFI Form D Reading

Comprehension Test, 0.9 GED units below the targeted 7.0 goal. All men go directly to Basic Combat Training (BCT); those tagged for FLIT are administered a JRTT and the USAFI on completion of BCT. Men averaging below 7.5 on these two tests enter FLIT.

Questionnaire responses for 130 men in the first 16 FLIT classes (170 men) showed a median age of 19, a median of 12 years education completed, about two-thirds with a high school diploma or GED equivalent. Two-thirds of the men were non-white-American; 25% were foreign-born and one-half of these had lived in the U.S. for one year or less; English was not the primary language for approximately one-third.

The program began in April 1972; since then 74 classes have completed the program for a total of 625 men.

Curricula -- The six-week FLIT job reading program is a total set of components in an instructional system, including selection of students and staff, curriculum development, materials and methods development, and program evaluation. FLIT consists of modular instructional/learner units designed for young adults with marginal English language skills. FLIT's development is based on the compelling conclusions that improvements in job proficiency through 6-week GED training have been unsatisfactory and that the GED curriculum has little direct bearing on job reading tasks.

Instructional modules in each career cluster are based upon job-related Army technical manuals and materials, and are labelled: (1) Table of Contents, (2) Indices, (3) Tables and Graphs, (4) Body of Manual Extracting Information, (5) Procedural Directions and (6) Job Forms. Modules 1-4 have both printed and audio components, with pre- and post-tests for each component. Module 5 has only a printed component, with pre- and post-tests. In Module 6, ability to perform each form provides pre- or post-test data on that form and there is no single modular pre- and post-test. These materials are available for six career clusters: Combat, Medic, Cook, Communication, Clerical and Mechanical.

At the start of each module (e.g., Table of Contents), the trainee takes a proficiency pretest. If he passes, he skips the printed materials in the TOC module and takes the audio pre-test, and if he passes this goes on to the next module (e.g., Indices). Whenever a trainee fails a pretest, he must complete work in the module and take a module post-test, and when passing with 90% correct in 20 minutes, proceeds to the next module. If he fails the post-test, he is recycled through additional work until the 90/20 criterion is reached.

At the end of the sequence of all modular units (which may be finished in less than 6-weeks at an individual trainee's pace), the trainee is retested with an alternate form of the JRTT and an alternate form of the USAFI test. Trainees averaging 7.0 for both are released and certified from FLIT with orders to AIT/CST (Advanced Individual Training or Combat Support Training) to be trained for his job. However, if he fails end of program tests and is in the sixth week, the trainee is sent to AIT/CST also; if not in the sixth week, JRTT test results are examined and an individualized instructional sequence is made up for him, which is continued until he passes or 6 weeks are up, and is then sent to AIT/CST.

Material -- Reading training is focused directly on a trainee's job reading materials. For example, in the TOC module, each trainee receives an assignment packet containing a list of job reading materials (photocopied parts of technical materials in the early modules; advanced students use the manuals themselves) and worksheets to be completed.

Materials used for word attack and comprehension are currently non-job related and make up the developmental or general reading component, which comprises about half of the six-hour daily program, with the other half devoted to job reading. Additional R and D is underway to produce and add job reading training materials that will emphasize word attack, higher level comprehension and job concepts and skills, so that the general reading component is phased out. Instructors also have discretionary control over some reading, writing and discussion activities.

Staffing -- The FLIT program is placed in the regular training pipeline between BCT and Advanced Individual Training. The FLIT program at Fort Ord is an experimental program and is staffed by research personnel from HumRRO as well as by teachers from the Fort Ord Education Office. However, following review of the program by the sponsor (Training and Doctrine Command, U.S. Army) the FLIT program is being implemented at Fort Knox, Kentucky; Fort Dix, New Jersey; Fort Jackson, South Carolina; Fort Polk, Louisiana; Fort Leonard Wood, Missouri. At these locations, all instructional and administrative staff are civilians from the respective Education Offices.

Staff training and recruitment -- Administrators and teachers are hired by the Army Education Officer at each Fort following guidance provided by the Training and Doctrine Command. In implementing FLIT Army-wide, HumRRO provides on-the-job training by working at each new site until local staff can operate the program.

Facilities -- All program sites are at US Army posts. The average class size is 15-20. Six classes (one per week) are typically in progress at a single site. At Fort Ord, four classrooms are needed -- two for three MOS-clusters each, one for general reading, and one for other activities (testing; administration).

Costs -- Major costs for FLIT were for research into job requirement and skill assessment, which led to the development of a totally revised training model focussed on job reading tasks. It is this model that is recommended for replication in civilian-related settings such as office and clerical work, correctional facilities, policework, services, motor mechanics and electronics repair, and para-professional medical work. Real costs for replication, say in an instruction setting such as a junior college articulated to feeder high schools, or in a large agency or business capable of developing an employee training program, would also involve staff reading assessment, construction of on-the-job reading tasks and the administration, staffing and the development and evaluation of the training program.

Entry skill training for marginal readers require cost estimates for:

Research:

(a) Job reading requirements.

(b) Job incumbent reading skills.

(c) Job candidate reading skills.

(d) Job performance measures.

Development:

(e) Job related reading task tests:

(f) Relate (b) to (d); set minimum job level requirements

(g) Estimate disparities (c) - (f)

(h) Develop training modules and pre- and post test modular criteria measures

Program:

(i) Administration

(j) Selection

(k) Instructional staff training

(l) Materials

(m) Facilities

(n) Evaluation and follow-up

Obviously costs will vary considerably from one potential situation to another depending on the level of R and D effort already operating, the training or teaching staff already available.

EVIDENCE OF EFFECTIVENESS: (See attached section.)

EVIDENCE OF EFFECTIVENESS:

Evaluation conducted by. Drs. John Caylor and Thomas Sticht, HumRRO, Presidio of Monterey.

Comparison methods. The effectiveness of FLIT is reported on three general bases:

(a) the number of trainees reaching 90/20 criteria (90 percent correct in 20 minutes) level for each FLIT module.

(b) an entry-exit comparison of FLIT trainees on general and job related reading tests showing the percentage of trainees reaching the 7.0 target goal after experiencing each written and audio module.

(c) a comparison of grade equivalent gains in general reading and in job related reading for FLIT participants, enrollees in the APT program, enrollees in the Air Force literacy program, and marginal readers enrolled in no literacy program.

Results. (a) Data are for trainees in 6 career fields combined classes 40 through 60 (20 weeks of input) reaching 90/20 performance on Written Module.

Module	N	% Passed Pre Test	% Passed Post Test	% Did Not Complete
Table of Contents	112	27%	66%	7%
Index	111	14	69	16
Tables & Graphs	111	37	53	10
Body of Manual	107	0	70	30
Procedural Direction	81	4	35	61

Examination revealed that failure to reach criterion was mainly because of time rather than accuracy (90% in 20 minutes).

Similar data for FLIT classes for the Audio Module are shown:

Module	N	% Passed Pre Test	% Passed Post Test	% Did Not Complete
Table of Contents	88	46 %	39 %	16 %
Index	93	27	37	37
Tables & Graphs	80	55	24	21
Body of Manual	70	17	50	31

(b) For 67 FLIT trainees (classes 40-50, selected on the 6.1 cutoff level) the percentage reaching criterion 7.0 during the entry week and the exit week is shown.

Testing	General Reading %	Job Related Reading %
Entry Week	12%	18%
Exit Week	55	84
Gain	43	66

(c) General reading gains for FLIT, the USAF training program and the comparative ongoing reading program in the Army were compared (FLIT and Army programs were 6-weeks duration, the Air Force program was 13 weeks) were:

Program	N	Week 1	Exit Week	Gain
FLIT [a]	304	5.9	6.6	.7
Air Force	277	5.2	6.7	1.5
Army	8,999	4.0	5.6	.7

[a] based on 304 men in first 53 weeks (classes)

On job related reading gains, comparisons for samples on the three programs were:

Program	N	Enter	Exit	Gain
FLIT	149	6.8	8.7	1.9
Army	124	4.7	5.2	0.5
Air Force	56	6.1	6.7	0.6

These tables indicate that FLIT is equally as effective as other military literacy programs in improving general reading, and far more effective in improving job related reading skills -- skills not taught in the GED program.

(d) A comparison of trainees in FLIT classes 40-60 with a group of light vehicle drivers who scored below the 6.6 grade level on the USAFI general reading test and who received no literacy training were compared on general reading and job related reading tests.

	GENERAL READING				JOB READING			
Trainees:	No Literacy Training		FLIT		No Literacy Training		FLIT	
	N Mean	S.D.	N Mean	S.D.	N Mean	S.D.	N Mean	S.D.
Entry	35 5.50	0.83	94 5.08	0.76	35 6.72	1.77	94 5.44	1.74
Exit	35 6.24	2.00	94 6.60	1.67	35 7.59	2.50	94 8.05	2.40
Gain* (Grade Units)	0.74		1.52		0.87		2.61	
Gain (In Multiples of Entry S.D.)	0.89 S.D.		2.00 S.D.		0.49 S.D.		1.50 S.D.	

*Differences between No Literacy Training and FLIT gain scores for General Reading $t = 2.51$, $p < .01$; Job Reading $t = 4.66$, $p < .001$.

The No Literacy Training group showed gains in reading expected due to retest unreliability or regression. The FLIT gains are statistically significantly higher than the gains expected due to testing artifacts.

Reliability of measures. The USAFI Intermediate Reading Tests are the Metropolitan Achievement Tests - Intermediate Level with a median split-half reliability (based on 6th grade children's scores) of .90. Kuder-Richardson (KR Formula 21) reliability coefficients for three forms of the Job Reading Task Tests (based on adult scores) are .94, 93 and .94. Test-retest reliability on alternate forms of the JRTT for 34 functional literacy students taken 6 weeks apart was .76 uncorrected for attenuation due to the limited range of reading abilities of the FLIT students.

Educational significance. Data collected for FLIT classes during the first year of the program support the conclusions that the FLIT program treatment, though not uniformly successful in reaching criterion in all modules, was effective in elevating both general and more particularly job related reading test performance at or above the targeted 7.0 level. This minimum level as indicated was established on real-job performance requirements and was higher than existing comparison program levels. The educational significance of the approach is what is stressed in particular, the model's generalizability to civilian-related reading training programs in adult education, business and agency reading programs geared to recruitment of marginally-skilled employees and possible promotion upgrading.